```matlab
clear all;

% Parameters:
N = 128;
NP1 = N + 1;
L = 1.0;
dt = 0.001;
TF = 10;
Re = 40;
c = (2/Re)*log(N);

% Initial condition:
for i=1:NP1
    if (i < N/2 + 1)
        x(i) = 2*(1-c)*(i-1)/N;
    else
        x(i) = 1 - c + 2*c*(i - 1 - N/2)/N;
    end
    un(i) = 1-x(i);
    ue(i) = (exp(Re) - exp(Re*x(i))) / (exp(Re) - 1);
end

% Exact solution:
plot(x, ue, '-x');
figure(1);
xlabel('x');
ylabel('u(x,t)');
title('Exact solution (N = 128)');
pause

% Time loop
t = 0.0;
while (t < TF)

    % Interior points
    for i=2:NP1-1
        dx(i) = x(i) - x(i-1);
        dx(i+1) = x(i+1) - x(i);
        a = dt / dx(i);
        b = dt/ dx(i+1);
        u(i) = un(i) - a*(un(i) - un(i-1)) + Re^-1 *b*((un(i+1) ...
            - un(i))/b - (un(i) - un(i-1))/a);

        error(i) = abs(ue(i) - u(i));

    end


    % Boundary points
    u(1) = 1.0;
    u(NP1) = 0.0;
```

```matlab
    % Update solution
        un = u;

    t = t + dt;

end
e = max(error(i));


% Numberical solution:
plot(x, u, '-x', 'LineWidth', 2);
xlabel('x');
ylabel('u(x,t)');
title('Numerical solution (N = 128)');
pause
```